

I thank the Batty Library, Perth for access to originals of their Darwin letters, and for making available the print from which Fig 1 was made. Work in Cambridge and Philadelphia was undertaken while I was on study-leave from the University of Western Australia, and partly supported by the National Geographic Society (Washington). I thank Joe Gentilli for his comments on a draft of this paper. I also thank an anonymous referee for detailed comments on the modern taxonomy on some of the Western Australia plant species mentioned.

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NATURAL HISTORY NOTES ON LIZARDS FROM THE ROE PLAIN, WESTERN AUSTRALIA

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INTRODUCTION

As part of a six week lizard collecting field trip to Western Australia during late spring and early summer of 1989, we spent six days (5-10 November) working at several localities on the Roe Plain in southeastern Western Australia. Previous reports on the reptiles of this area are largely restricted to checklists with locality data and "where found" ecological data (Martindale 1980; Storr *et al.*, 1981; Dyer 1985, and Congreve 1985). We present here a brief resume of some basic natural history information on the reptiles, mostly agamid and scincid lizards, we encountered, with special emphasis on reproduction, size and colour features.

STUDY AREA

The Roe Plain is a coastal plain extending from Wilson Bluff to Twilight Cove. It is backed by an emerged limestone sea cliff, the Hampton Range, with an elevation of approximately 70-120m and has a maximum width of approximately 40km (Lowry 1970). The Plain is of low relief and consists of sandy/clayey soils carrying grass and low to tall shrublands. The Eyre Highway, the transcontinental highway across the southern part of the continent, traverses the eastern part of the Roe Plain between Eucla and Madura. We worked in this part of the Plain between the latitudes 31°40' and 32°05'S. The localities worked, with brief descriptions of each are as follows.

1. Approximately 26.5km W of Mundrabilla Roadhouse via Eyre Hwy then 3.4km N on track, Mundrabilla Station; 5-8 Nov. The top, slope and bottom of the Hampton Range escarpment and the adjacent plain in the vicinity of the original Mundrabilla homestead.
2. Approx. 0.7km ENE of the old Eucla telegraph station; 6 Nov. Open shrubland on a white sand dune just behind and contiguous with the bare white coastal dunes.
3. 11.5km W of Mundrabilla Roadhouse via Eyre Hwy then S 21.0km on dirt track, Mundrabilla Station; 7 Nov. Open shrubland on a dune running parallel to the coast, just inland from a sandfire flat behind the coastal dunes.
4. 11.5km W of Mundrabilla Roadhouse via Eyre Hwy then S 16.3km on a dirt track, Mundrabilla Station; 7 Nov. Shrubland on north edge of an interior dune system in the middle of the Roe Plain.
5. Approx. 0.5km E of Madura Roadhouse via Eyre Hwy then 16.7km S on a dirt track; 9 Nov. Shrubland on sand plain.
- 5a. Approx. 0.2-1.0km W of Madura Roadhouse along track, Madura Station; 10 Nov. Mallee shrubland at base of escarpment just below lookout at Madura Pass.

In the following accounts localities are identified simply by their number as listed above.

DATA ON SPECIES

Agamidae

Amphibolurus norrisi. Five specimens were collected from 5 localities (1-1 specimen; 2-1; 5a-1; 4.6km N of loc. 4-1; 3.7km N of loc. 4-1. Two specimens are males with SVLs of 73 and 95mm and three are females with SVLs 98-115mm (\bar{x} =104.7, sd =9.07). All the females are gravid with 5-8 oviducal eggs (\bar{x} =6.7, sd =1.53). In southeastern Australia, females gravid with oviducal eggs have been found in September-November and had clutch sizes ranging 3-7 (\bar{x} =4.8, n =17) (Witten and Coventry 1984).

Like its presumed near relative from eastern Australia, *Amphibolurus muricatus* (Witten and Coventry 1984) this species has the mouth bright orange-yellow.

This species is partially saxicolous and arboreal as well as terrestrial. One specimen was basking on a small rock pile and another fled to a perch about 0.3m off the ground in the base of a mallee shrub.

Ctenophorus maculatus dualis. Thirty-seven specimens were collected from three localities (2-20, 3-16, 5-1). There are 19 males measuring 33-53mm SVL (\bar{x} =44.3, sd =5.87) and 18 females measuring 37-62mm SVL (\bar{x} =48.5, sd =7.58). Females may attain larger size than males as six females exceed the size of the largest male, i.e. > 55mm. In the vicinity of Eyre Bird Observatory, males also appear to be slightly smaller than females (SVL=50-56mm, \bar{x} =53, n =16 vs 50-62, \bar{x} =56, n =20; Dyer 1985).

Testis and epididymis size increases gradually with body size over the lower end of the size range, making it difficult to categorise males into immature and mature. Females of 37-47mm SVL (n =10) are non-gravid whereas those of 48-62mm SVL (\bar{x} =55.63, sd =4.87, n =8) carry either vitellogenic ova (n =1) or oviducal eggs (n =7). Clutch size ranges 2-4 (\bar{x} =3.0, sd =0.76, n =8). There is a strong positive correlation between female size and clutch size (r =0.97, P <.001). Copulation in this somewhat southern subspecies has been observed "in late September and early October" (Storr *et al.* 1981).

All males for which observations were made (n =14, SVL=36-53mm, \bar{x} =44.0mm, sd =5.01) had well developed red colour in the dorsolateral stripe whereas all females (n =15, SVL=37-62mm, \bar{x} =47.7mm, sd =7.63) had only the faintest indication of red, or none at all (see also Dyer 1985).

The mouth and tongue colour of this species is pink.

Specimens were usually seen in open areas with scattered low shrubs into which they would often flee.

Ctenophorus pictus. Two specimens were collected at two localities (1 and 19.8km N of 3). Both are gravid females and measure 65 and 70mm SVL. The larger specimen has three oviducal eggs and the smaller has five enlarging follicles (\bar{x} =4.0, sd =1.41).

The mouth and tongue colour of this species is pink.

The specimen from the second locality was released from being half-swallowed by a dugite (*Pseudonaja affinis*). It survived the effects of this predation attempt and when sacrificed three days later was suffering only some moderate paralysis in the rear legs.

Rankinia (= *Amphibolurus* or *Tympanocryptis* of previous usage) *adelaidensis chapmani*. Four specimens were collected at two localities (1-1; 4-3). Three are males measuring 34-43mm SVL (\bar{x} =39.3, sd =4.72) and one a female measuring 46mm. The female is gravid with an egg in the right oviduct and with either a yolking follicle or oviducal egg on the left side (damaged). A female collected at Cape Le Grande National Park in December carried three oviducal eggs (Chapman and Dell 1975).

No specimen had any external chromatic hues. However, the roof of the mouth was light blue, the throat black and the tongue grey with a black base (over area coincident with dark throat). The blue mouth colour is similar to that of *Rankinia diemensis* from southeastern mainland Australia (Kent 1987).

All specimens were sitting quietly in the open when first seen and then ran to the cover of a nearby shrub when disturbed.

Gekkonidae

Christinus marmoratus alexanderi. Two specimens were collected at one locality (1), a male measuring 33mm SVL and a gravid female measuring 46mm SVL and carrying two oviducal eggs. No inguinal fat bodies were evident in the gravid female and her parietal peritoneum is unpigmented.

Underwoodisaurus milii. A young male (1) of 63mm SVL has moderately sized inguinal fat bodies. The parietal peritoneum is unpigmented.

Scincidae

Cryptoblepharus virgatus. One female (5a-1) measuring 38mm SVL carries two enlarging follicles.

Ctenotus brooksi euclae. A single adult male (1) measures 43mm SVL. The tongue is very dark blue in colour.

Hemiergis initialis brookeri. Thirty-seven specimens were collected from three localities (1-2, 2-33, 3-2). Sixteen are males and 21 are females. Females attain larger size than males (29-43mm, $\bar{x}=38.8$, $sd=3.45$ vs 28-38mm, $\bar{x}=33.5$, $sd=2.85$; $t=4.64$, $P<.001$). Males show no obvious size class separation between immature and mature individuals, there being a gradual increase in gonad and epididymal duct size with body size over the lower end of the size range. Females smaller than 36mm SVL ($n=2$, 29 and 32mm) are immature and those above 36mm ($n=17$, 38-43mm) are mature with either ovigerous follicles ($n=6$) or developing oviducal young ($n=10$; one female cannot be placed confidently in either category due to damage). Of three females measuring 36mm SVL, two are immature and one mature (oviducal young). Hence maturity in females appears to be attained at a SVL of approximately 36mm. The 17 reproductively active females average 40.1mm SVL ($sd=1.82$) and carry 1-2 ($\bar{x}=1.65$, $sd=0.49$) follicles or young; females with a litter size of one are significantly smaller than those with a litter of two ($\bar{x}=38.7$ mm, $sd=1.63$, $n=6$ vs $\bar{x}=40.8$ mm, $sd=1.47$, $n=11$; $t=5.51$, $P<.001$; cf. *Lerista picturata baynesi*).

A characteristic, but not invariant (Shea and Miller 1986), feature of the subspecies *Hemiergis initialis brookeri* is the absence of prefrontals (the subspecies *H. i. initialis* retains them); all 37 of our specimens lacked prefrontals.

Specimens were most often found in the more central parts of the litter mats beneath mallee shrubs. Here the litter is thicker, contains more particulate organic matter (stems, etc.) and is more heavily shaded than in the outer parts of the mats (cf. *Lerista picturata baynesi*). This position is the cooler part of the litter and is in keeping with the generally low critical thermal maximum body temperatures of *Hemiergis* (e.g. < 32.8 - 40.2°C ; Greer 1980). This species is also more likely to "freeze" or only move away slowly when uncovered in contrast to *Lerista picturata baynesi* (below).

Lerista picturata baynesi. One hundred and one specimens were collected from 5 localities (1-1, 2-34, 3-38, 4-8, 5-20). There are 45 males and 54 females and 2 of undetermined sex due to damage. Females apparently attain larger size than males, as 16 of 54 females exceed the size of the largest male, i.e. 80mm. Amongst the males, those measuring 38-63mm SVL ($\bar{x}=49.1$, $sd=9.27$, $n=17$) were judged to be immature (testis small, white, epididymal duct not evident) and those measuring 66-80mm ($\bar{x}=72.3$, $sd=4.08$, $n=28$) mature (testis larger, yellow, epididymal duct evident).

Amongst the females, those carrying vitellogenic follicles or shelled oviducal eggs measure 71-87mm SVL (\bar{x} =80.6, sd =3.14, n =28) and their clutch size ranges 1-4 (\bar{x} =2.21, sd =0.63); there was no correlation between female SVL and clutch size (r =.10, P >.05; cf. *Hemiergis initialis brookeri*). The non-gravid females (n =26) measure 41-82mm SVL (\bar{x} =64.5, sd =13.22) with nearly half (n =12) attaining or exceeding the size of the smallest reproductive female, i.e. 71mm. As all but three of the reproductive females are vitellogenic, with many in the early stages, some or all of the non-reproductive females could be pre-ovulatory. In general it would appear that males mature at a SVL of approximately 66mm and females at approximately 71mm.

Many specimens had the ventral part of the body and anterior tail suffused with pale yellow.

Specimens were found most often in the outer parts of the litter mats beneath mallee shrubs. Here the litter is thinner, contains more inorganic matter (sand) and is less shaded than in the inner part of the mat (cf. *Hemiergis initialis brookeri*). This position in the warmer part of the litter mat is in keeping with the generally high critical thermal maximum body temperatures of *Lerista* (e.g. ≥ 40.9 - 47.0°C ; Greer 1980). This species almost invariably "drives" immediately into the sandy substrate when uncovered, in contrast to *Hemiergis initialis brookeri* (above).

The species will bite when grasped.

Lerista dorsalis. Fifteen specimens were collected from four localities (1-7; 2-6; 3-1; 5-1); seven specimens are males with SVLs 36-49mm (\bar{x} =45.3, sd =4.72) and eight are females with SVLs 32-57mm (\bar{x} =44.4, sd =7.98). Three of the females match or exceed the size of the largest male (i.e. SVL > 49mm). The smallest male is immature while the remainder (SVL 46-49mm, \bar{x} =47.2, sd =1.30) are mature. Five females of SVL 32-46mm (\bar{x} =39.8, sd =5.67) are non-reproductive while the remaining three with SVLs 44-57mm (\bar{x} =52.0, sd =4.36) carry 2-3 (\bar{x} =2.3, sd =0.58) enlarging ovarian follicles (n =2) or shelled oviducal eggs (n =1).

All specimens had the throat and ventral body clear.

Menetia greyii. Six specimens were collected from three localities (1-1; 2-4; 3-1). The one male, measuring 29mm SVL, seems mature (enlarged, turgid gonads, well developed epididymes). Of the five females two, measuring 25 and 27mm SVL, are immature (small ovaries) and three, measuring 32-33mm SVL (\bar{x} =32.3, sd =0.58) are gravid with 1-2 (\bar{x} =1.7, sd =0.58) enlarging ovarian follicles (n =1) or oviducal eggs (n =2). All these maturation and reproductive parameters are consistent with those determined from much more comprehensive work on this species from localities north of Adelaide in eastern Australia (Smyth and Smith 1974).

Morethia adelaidensis. A single gravid female (1) measures 55mm SVL and carries 5 enlarging developing follicles.

Morethia obscura. Seven specimens were collected from four localities (2-3; 3-1; 4-1 and 5a-2). Four are males, one immature with SVL 30mm and three mature with SVLs 43-47mm (\bar{x} =45.3, sd =2.08). Three females measure 49-52mm SVL (\bar{x} =50.3, sd =1.53) and each carries 3 enlarging follicles (n =2) or oviducal eggs (n =1).

Tiliqua rugosa. Specimens were seen at two localities (1, 2). The basic colour pattern is brown with white flecks and mottling.

DISCUSSION.

The preceding observations indicate that in all 12 lizard species for which there were adequate samples (all except *Underwoodisaurus milii*, *Ctenotus brooksi euclae* and *Tiliqua rugosa*) the Roe Plain populations we surveyed were very active in terms of female egg production. All adult females the same size or larger than the smallest reproductively active female found in each species carried vitellogenic follicles or oviducal eggs or young in nine species while a very high proportion of similarly defined females were reproductively active in the remaining three species (*Hemiergis initialis brookeri* — 89%; *Lerista picturata baynesi* — 70%, and *L. dorsalis* — 75%). This high incidence of female reproductive activity is probably typical of most lizard populations in late spring in southern (temperate) Australia (Shine 1985; Greer 1989).

The variation in mouth and tongue colour evident between different species of dragon suggests that this is a potentially important taxonomic character in these and perhaps other lizards (e.g. Storr 1988, Greer 1989). For this reason mouth and tongue colour should be noted on living specimens prior to their release or sacrifice.

The observation of the *Ctenophorus pictus* which suffered only partial paralysis after being partially engorged by a *Pseudonaja affinis* suggests that this lizard species may have some resistance to the venom of what is likely to be a locally common predator. If this were true, it would add to those few other cases of Australian lizard species known to be relatively resistant to the venoms of their elapid snake predators (Minton and Minton 1981).

ACKNOWLEDGMENTS

We thank J. Nancarrow for typing, Ross Pogson and Glen Shea for bibliographic help, G. Shea for critically reading the manuscript, the owners of Mundrabilla and Madura Stations for permission to work on their properties, and the Department of Conservation and Land Management for issuing the permit to carry out this work (SF 230). Roger Thorpe would like to thank the Trustees of the Australian Museum for a Visiting Fellowship.

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**ACACIA CYPEROPHYLLA VAR. OMEARANA,
A NEW VARIETY OF "MINNI RITCHI" ACACIA
FROM THE PILBARA REGION OF WESTERN AUSTRALIA.**

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ABSTRACT

A spectacular new Pilbara wattle, *Acacia cyperophylla* var. *omearana*, is described and illustrated. Trees of this variety are distinctive on account of their orange to orange-brown "Minni Ritchi" bark and their weeping branchlets and foliage.

INTRODUCTION

The purpose of this paper is to formally describe a spectacular new variety of the "Minni Ritchi" species *Acacia cyperophylla* ("Red Mulga"). This variety occurs in the Pilbara region of Western Australia where it is known from only a single population.

"Minni Ritchi" is the common name given to a very distinctive type of bark which occurs in a small group of Australian species of *Acacia* and is unique on account of its colour and the manner in which it exfoliates from the stems. "Minni Ritchi" bark varies in colour from deep red to reddish purplish, reddish brown, coppery or orange, and with age it commonly turns grey (where it may persist as a stocking at base of the main trunks as in *Acacia cyperophylla*). The bark peels off the trunks and branches in short,